CHAPTER 8: DRUM SECTION

CONTENTS

1. Theory of Operation
1. Master on Drum (in printing) Check Mechanism 1
2. Drum Set Check Mechanism 2
3. Ink Pack Set Check Mechanism 3
4. Ink Supply Mechanism 4
5. Drum Idling Mechanism 6
6. Squeegee Roller Rotation Mechanism 8

2. Removal and Assembly
1. Screen 9
2. Drum Body 10
3. Ink Sensor PCB 12
4. Squeegee Roller 13
5. Drum Support F & Drum Support R 15
6. Ink Pump Unit 18
7. Inking Motor 19
8. Ink Pack Set Sensor 20
9. Drum Set Sensor 20

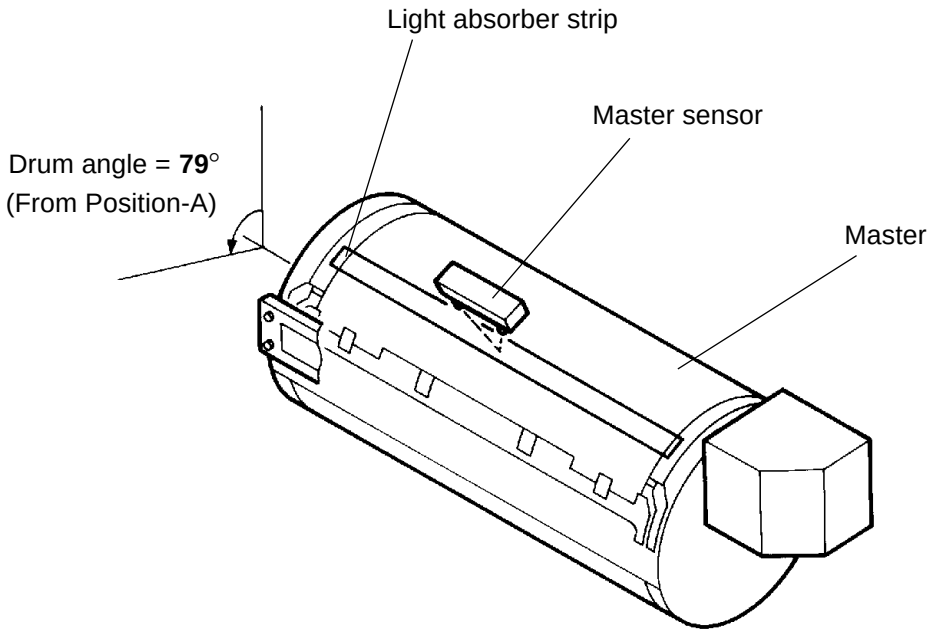
3. Adjustment
1. Squeegee Gap 21
2. Squeegee Pressure Balance 22
3. Ink Blocking Plate Position 23

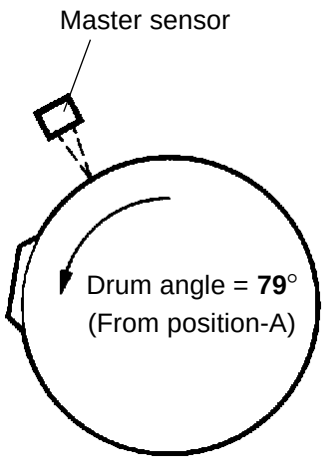
1. Theory of Operation

1. Master on Drum (in printing) Check Mechanism

1. Master Sensor

- Master Sensor checks the presence of master on the Drum before the start of printing.
- 79° Drum rotation after the first Position-A, the Master Sensor looks for the master on the Drum.
- The result (whether the master is found or not) is memorized until the Drum is pulled out of the machine or the power is turned off.
- If no master is detected on the Drum, **[C26]** is indicated on the Operation panel and stops the printing operation.

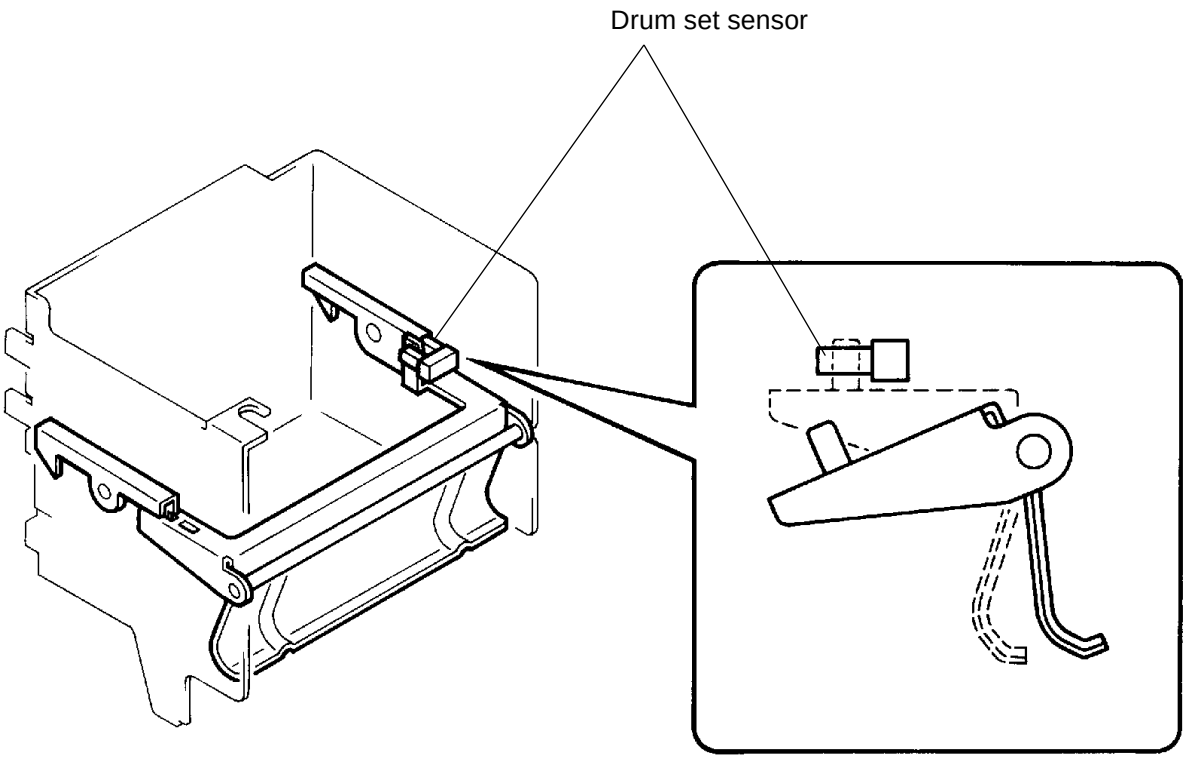




2. Drum Set Check Mechanism

1. Drum Set Sensor

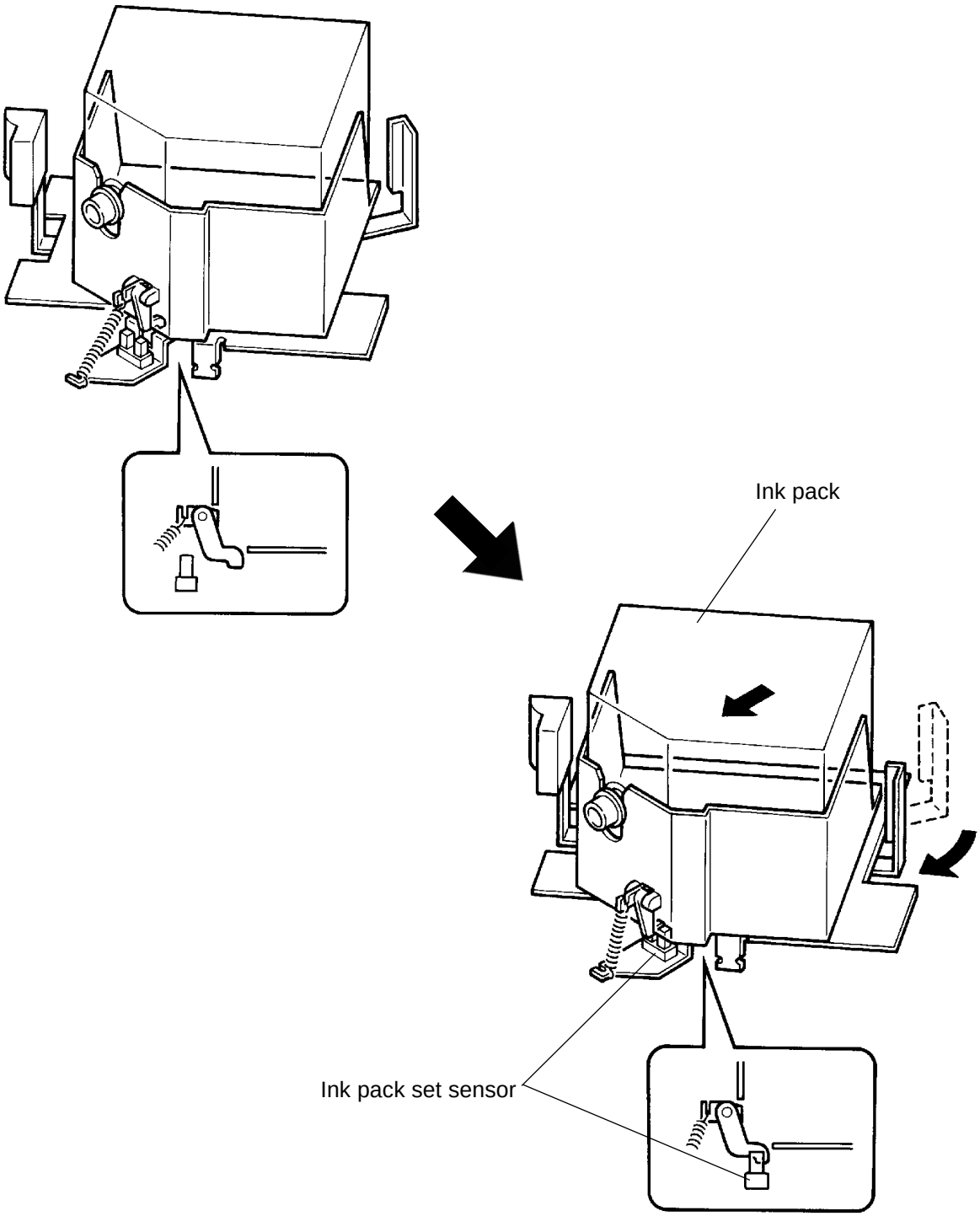
• Drum set sensor checks the presence of the Drum in the machine.



3. Ink Pack Set Check Mechanism

1. Ink Pack Set Sensor

• Ink pack set sensor checks the presence of the Ink pack in the Ink pack holder.



4. Ink Supply Mechanism

1. Ink Sensor PCB

- Ink sensor on the Ink sensor PCB checks the presence of ink in the Drum.
- Overflow sensor checks the ink overflow in the Drum.

2. Inking Motor

- Inking motor activates the Ink pump to supply the ink into the Drum when ink is not detected by the Ink sensor.
- Ink from the Ink pack is pumped through a hose into the Drum, on top of the Squeegee roller through Ink distributor.
- The Inking motor stops when the Ink sensor detects ink.

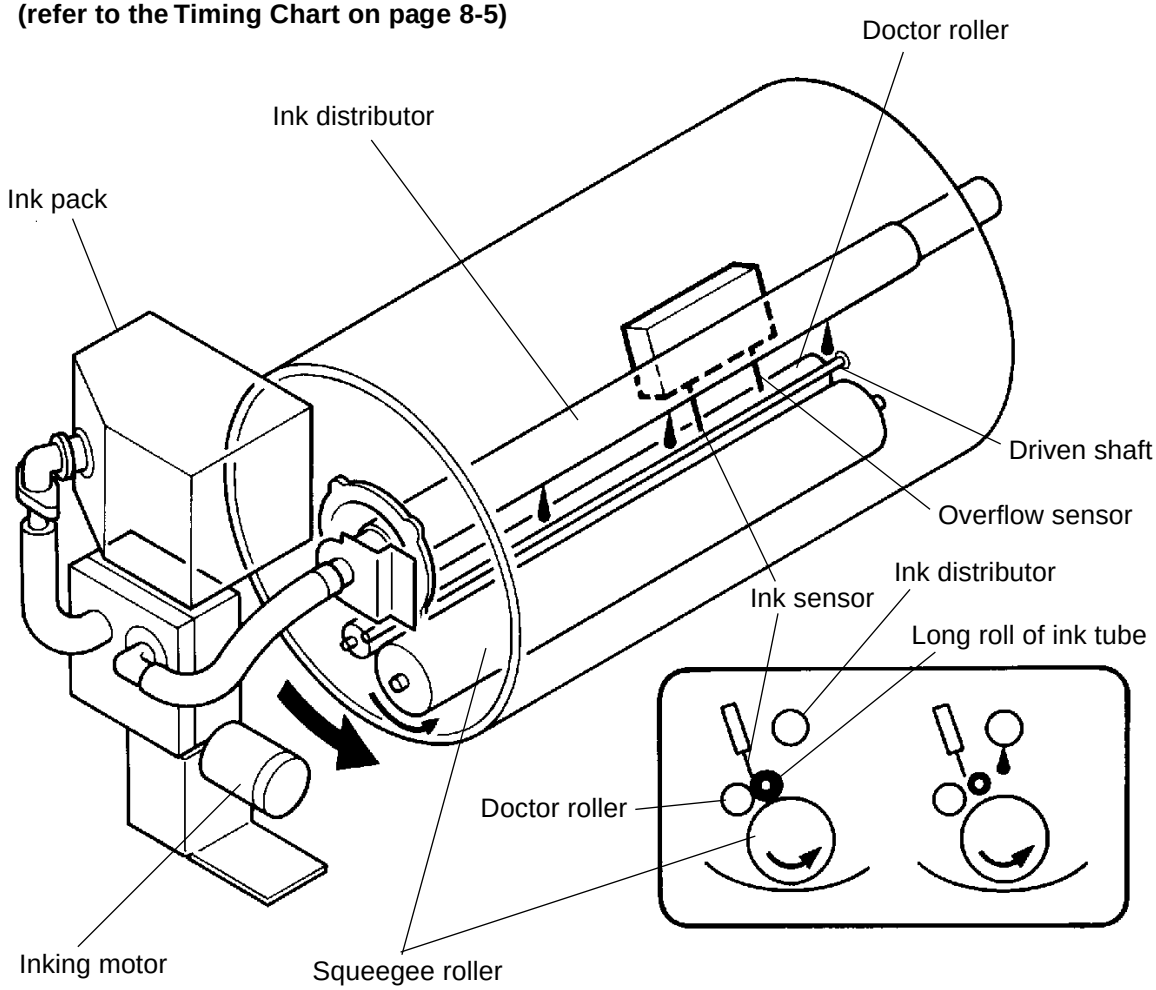
3. Ink Supply to the Inner Surface of the Drum

- The ink supplied on the Squeegee roller is transferred onto the Drum inner surface by the rotation of both the Squeegee roller and Drum.
- Excess ink is then made into a long roll of ink tube around a thin Driven shaft located between the Squeegee roller and Doctor roller and this excess roll of ink tube is checked by the Ink sensor and Overflow sensor.

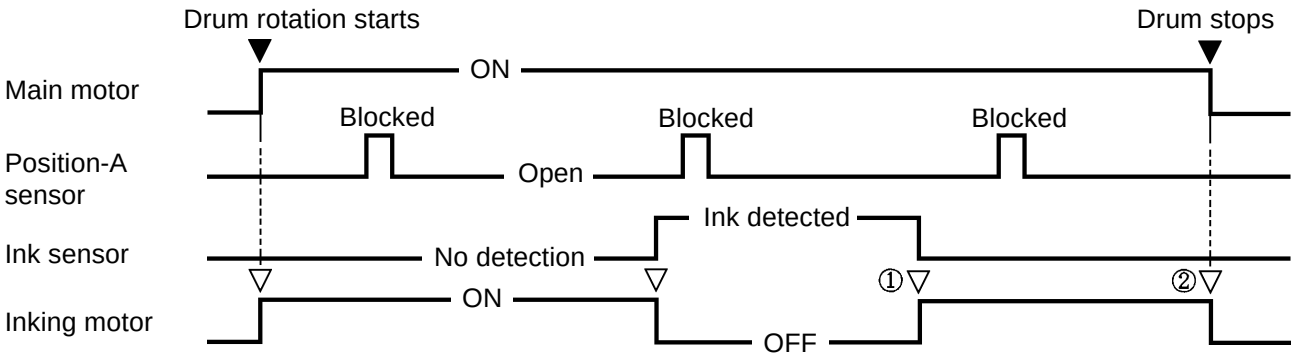
4. Ink Overflow

- If an excess amount of ink is supplied in the Drum and Overflow sensor detects the ink, the machine stops with **[E04]** indication on the Operation panel.

(refer to the Timing Chart on page 8-5)



Inking Timing Chart



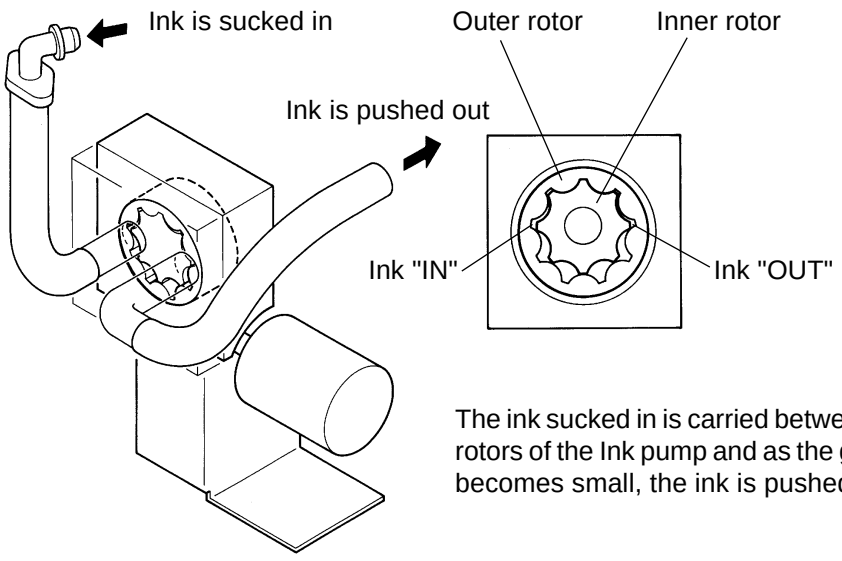
① The Inking motor does not activate at the start of Main motor even though the Ink sensor is not detecting the ink.

② The Inking motor activates when the light path of the Position-A sensor changes from "blocked" to "open" with the rotation of the Drum if the Ink sensor is not detecting the ink.

③ The Inking motor activates when the Ink sensor no longer detects the ink during printing.

④ The Inking motor turns off when the Main motor is turned off.

- If Ink sensor does not detect ink within **20 seconds** after the Inking motor is activated, the machine assumes that the Ink Pack is empty and **"Replace Ink Pack"** LED on Operation Panel is lit.
  If the machine power is turned OFF before the 20 second count, the counting continues from that point when the machine is turned ON again.
- If Over flow sensor detects ink for more than 0.5 seconds, the machine assumes that the ink has over flown within the Drum and displays error message **[E 04]**.
- If excess current is detected for more than 3 seconds after the Inking motor is activated, the machine assumes that the Inking motor has locked and indicates error message **[E 16]**.



The ink sucked in is carried between the Outer and Inner rotors of the Ink pump and as the gap between the rotors becomes small, the ink is pushed out.

5. Drum Idling Mechanism

1. Drum Idling

During printing, if the Ink sensor does not detect ink, the Inking motor activates to pump the ink from the ink pack into the Drum.
But if the Ink sensor does not detect the ink within 15 seconds after the Inking motor activates, the Drum goes into idling.

2. Paper feed stops during the Drum Idling movement

When the Drum idling starts, the paper feed stops and a group of dots • • • • • • • rotates within the Display window of the Operation panel to indicate that the Drum idling mode is in progress. The machine returns to normal operating condition when the Ink sensor detects the ink.

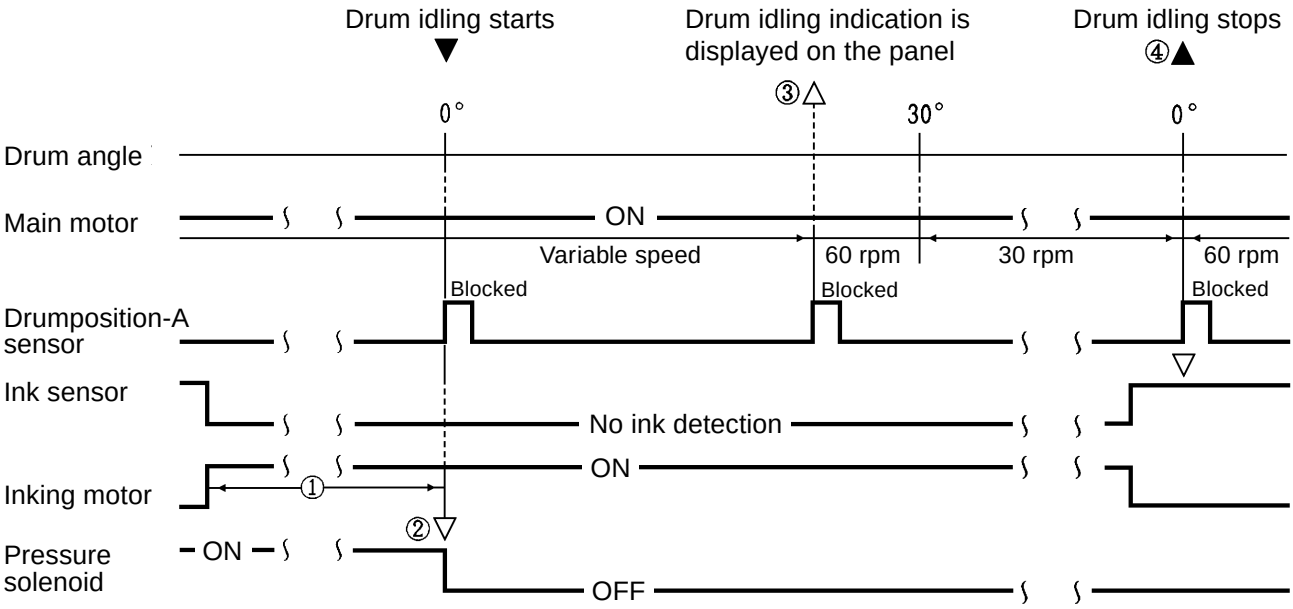
3. The condition for the Drum Idling to take place

The Drum idling takes place if the total of inkless time adds to less than 60 seconds and machine meets one of the following three conditions.

a. First machine operation after the power is connected to the machine.
b. First machine operation after pulling out and returning the Drum back into the machine.
c. First machine operation after machine was left idle for more than 24 hours.

(refer to the Timing Chart on page 8-7)

Drum Idling Timing Chart



① If the Ink sensor does not detect any ink within **15 seconds** after the Inking motor is activated, the machine goes into Drum idling from next Drum position-A.
But if the Ink sensor detects the ink before the Drum comes to position A, the Drum idling movement is cancelled, and the printing starts.

② The Drum idling movement starts from the Drum position-A, which is equal to Drum at 0°, and deactivates the Pressure solenoid.

③ At the second Drum position-A, the Panel on the machine indicates the Drum idling display.

④ During the Drum idling movement, the Ink sensor is checked at every Drum position-A for any ink detection.
If ink is detected, the Drum idling movement ends and the printing starts.

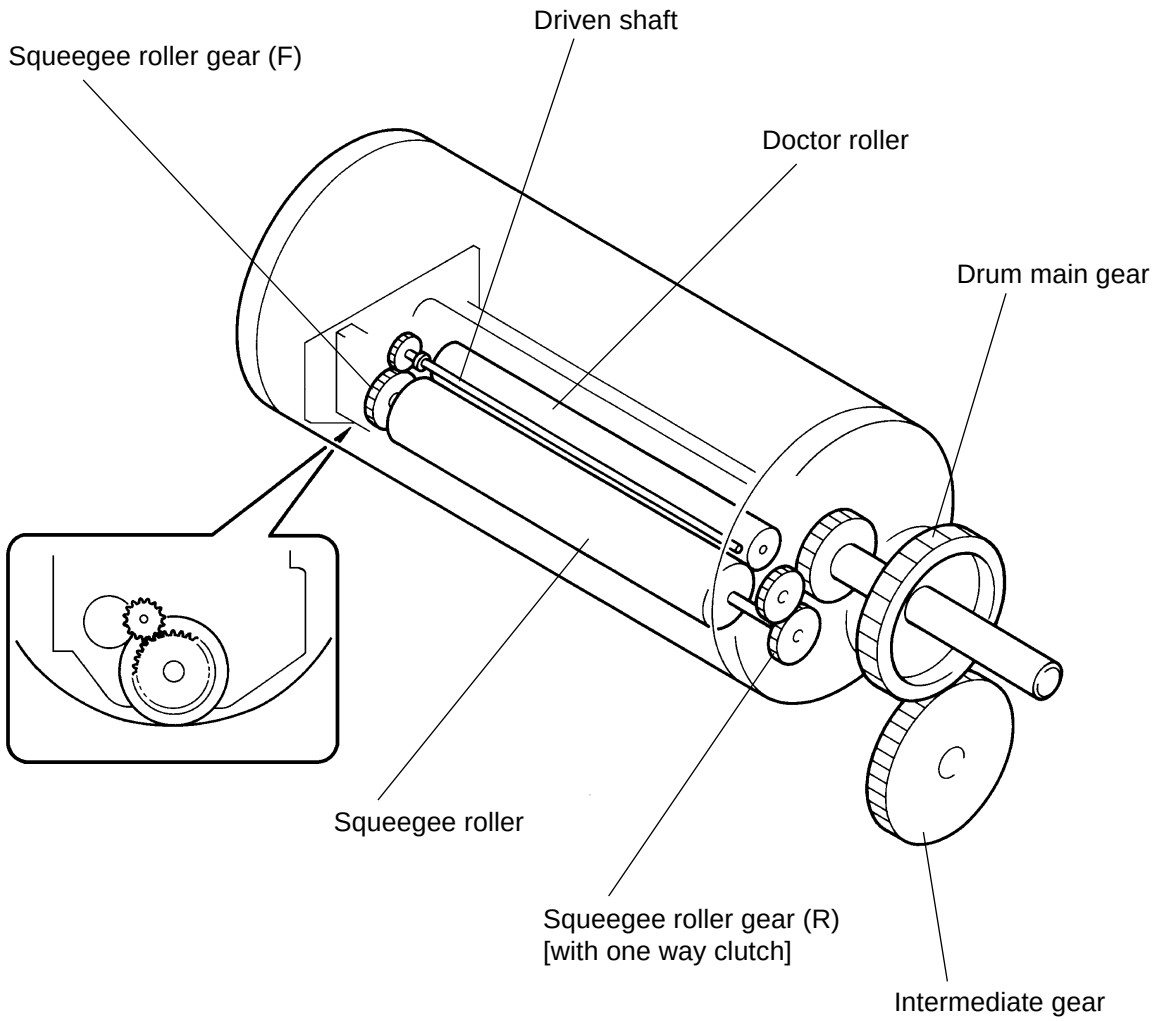
- If the Ink sensor does not detect any ink within **90 seconds** after the Drum idling started, the machine assumes that the Ink pack is empty and lights the **"Replace Ink Pack"** LED on the panel and indicates the message **[C 41]** on the display.

6. Squeegee Roller Rotation Mechanism

1. Rotation of the Squeegee Roller

Through the gears, the drive of the main motor is transferred to the Squeegee roller gear (R) and rotates the Squeegee roller.

The Squeegee roller gear (R) has one way clutch which prevents the Squeegee roller from rotating when the Drum is accidentally rotated in the opposite way by hand.

2. Rotation of the Driven Shaft

With the rotation of the Squeegee roller, the Squeegee roller gear (F) transfers the rotation to the gear on the Driven shaft and rotates the shaft.